UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P O Box 1450
Alexandria, Virginia 22313-1450
www uspto gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,756	09/29/2006	Kazuyoshi Inoue	ITO-0003	4694

23599 7590 07/27/2011
MILLEN, WHITE, ZELANO & BRANIGAN, P.C.
2200 CLARENDON BLVD.
SUITE 1400
ARLINGTON, VA 22201

EXAMINER	
BAND, MICHAEL A	

ART UNIT	PAPER NUMBER
1723	

NOTIFICATION DATE	DELIVERY MODE
07/27/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@mwzb.com

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/594,756
Filing Date: September 29, 2006
Appellant(s): INOUE ET AL.

Harry Shubin
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 6/13/2011 appealing from the Office action mailed 8/5/2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 1- 2 and 4

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the

subheading “WITHDRAWN REJECTIONS.” New grounds of rejection (if any) are provided under the subheading “NEW GROUNDS OF REJECTION.”

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant’s brief.

(8) Evidence Relied Upon

09176841	Fukuyoshi et al	7-1997
2006/0049410	Hosokawa et al	3-2006
2004/017137	Hosokawa et al	2-2004

Bhosale "Effective Utilization of Spray Pyrolyzed CeO2 as Optically Passive Counter Electrode for Enhancing Optical Modulation of WO3"

'Cerium', www.webelements.com

'Cerium oxide', www.wikipedia.com referencing Handbook of Inorganic Chemicals

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 112

- Claims 1-2 and 4 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 1 requires the abundance of trivalent cerium $[Ce^{+3}]/([Ce^{+3}]+[Ce^{+4}])$ is 0.01 to 0.6.

There is no support in the Specification or Drawings for the expression $[Ce^{+3}]/([Ce^{+3}]+[Ce^{+4}])$ to determine the abundance of trivalent cerium. Regarding Applicant pointing to para 0062 of the Specification for support, it is noted that there is support for the expression to determine the abundance of trivalent cerium results in the value 0.15, and not the range as claimed. Claim 1 requires the expression [Ce]/([In]+[Ce]) = 0.005 to 0.035. There is no support in the Specification or Drawings for this claimed range.

Claim Rejections - 35 USC § 103

- Claims 1- 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukuyoshi et al (JP No. 09176841) as applied to claim 1 above, and further in view of Hosokawa et al (WO 2004/017137), equivalent to Hosokawa et al (USPGPub 2006/0049410).

With respect to claims 1-2, Fukuyoshi et al discloses a sputtering target comprising mixed oxides of cerium oxide and indium oxide (abstract), where the particle diameter of each oxide incorporated into the target is 2 μm or less (para 0043-0044). Despite Fukuyoshi et al not specifying how the diameter of the particle is observed and measured, it is either inherent or obvious that any type of observing and measuring technique, including the claimed techniques, can be used since the particle diameter is a constant value that is not altered nor dependent by observing and measuring techniques. Fukuyoshi et al further discloses the sputter target comprising indium oxide and cerium oxide in addition to smaller quantities of tin oxide and titanium oxide (para 0027), where tin oxide has a concentration of 0.1at% to 5at%, titanium oxide has a

concentration of 0.1at% to 5at%, and cerium oxide has a concentration of 5at% to 60at% (para 0019, 0025, 0032). Taking the minimum amount of combined concentrations of tin, titanium, and cerium (i.e. 0.1at%, 0.1at%, 5at%, respectively) results in a balance of indium oxide 94.8at%, resulting in [5at%]/[94.8%]+[5at%] equals approximately 0.05. It has been held that a prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. See MPEP 2145.05, Section I. In addition it has been held that differences in concentration will not support patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration is critical. See MPEP 2145.05, Section II, Part A. Therefore it would be obvious to one of ordinary skill to use a slightly smaller concentration of cerium oxide, resulting in the claimed range, since one of ordinary skill would expect the sputter target to have the same properties.

However Fukuyoshi et al is limited in that while the cerium oxide is CeO_2, and thus is a positive quadravalent, it is not suggested for said cerium oxide to be Ce_2O_3, and thus being a positive trivalent.

Hosokawa et al teaches an inorganic (i.e. conductive) film formed via sputtering, and thus, from a sputtering target (p. 1, para 0013-0016; p. 2, para 0032-0039; p. 4, para 0090). Since the inorganic film is formed via sputtering, it is obvious that the sputtering target used to deposit said inorganic film comprises the components of said inorganic film. Hosokawa et al further teaches the inorganic film comprises one or more metals from Group A comprising In, Sn, Ga, Si, Ge, Zn, Cd, Mg, Al, Ta, and Ti and one

or more metals from Group C comprising Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu, where the compounds are oxides (p. 2, para 0032-0034, 0036). Hosokawa et al also teaches specific examples of the Group A compound as In_2O_3 and the Group B compound as Ce_2O_3 or CeO_2 (p. 3, para 0072, 0083).

Since the prior art of Hosokawa et al recognizes the equivalency of Ce_2O_3 and CeO_2 in the composition of sputter targets used to deposit conductive films, it would have been obvious to one of ordinary skill in the art to replace CeO_2 of Fukuyoshi et al with the Ce_2O_3 of Hosokawa et al as it is merely the selection of functionally equivalent cerium oxides recognized in the art and one of ordinary skill would have a reasonable expectation of success in doing so.

The combination of the references Fukuyoshi et al and Hosokawa et al teach a sputter target comprising a majority In_2O_3 and a mixture of Ce_2O_3 (trivalent) and CeO_2 (tetravalent). It is well known and inherent that CeO_2 is the most common and stable form, with the properties of redox chemistry involving concentrations of Ce^{+4}/Ce^{+3} dependent on the amount of oxygen present, as evidenced by Bhosale (*Effective utilization of spray pyrolyzed CeO2 as optically passive counter electrode for enhancing optical modulation of WO3*, Introduction; www.webelements.com, cerium; www.wikipedia.com, cerium oxide referenced by *Handbook of Inorganic Chemicals*).

Therefore the abundance of trivalent cerium present in the sputtering target is a result-effective variable dependent on the amount of oxygen present, with it being held that a particular parameter must first be recognized as a result-effective variable, i.e. a variable which achieves a recognized result, before determination of the optimum or

workable ranges of said variable might be characterized as routine experimentation. See MPEP 2144.05, Section II, Part B. Therefore one of ordinary skill would find it obvious that by varying the oxygen concentration results in different concentrations, including the claimed concentration, of trivalent cerium.

With respect to claim 4, modified Fukuyoshi et al further discloses the density of the indium oxide and cerium oxide sputter target is 6.9 g/cm^2 and a resistance of 2x10^{-2} Ωcm (para 0057, 0061).

(10) Response to Argument

Appellant's arguments filed in Brief 6/13/2011 have been fully considered but they are not persuasive.

- On p. 3-4, the Appellant argues that there is support for the abundance of trivalent cerium $[Ce^{+3}]/[Ce^{+3}]+[Ce^{+4}]$ is 0.01 to 0.6 at para 0033 and para 0062 of the Specification.
- The Examiner respectfully disagrees. The Appellant's Specification at para 0033 teaches the **general** abundance of trivalent cerium is between 0.01 to 0.6, where para 0062 teaches a **specific** type of the abundance of **positive** trivalent cerium is $[Ce^{+3}]/[Ce^{+3}]+[Ce^{+4}]$ (emphasis added). The claimed expression $[Ce^{+3}]/[Ce^{+3}]+[Ce^{+4}]$ relates only to the specific positive trivalent, whereas the claimed range 0.01 to 0.6 relates to the general trivalent cerium. Regarding Appellant's clarification of support on p. 4, the Examiner summarized response is as follows:

--claim does **not** require the abundance of positive trivalent cerium $[Ce^{+3}]/[Ce^{+3}]+[Ce^{+4}]$ is 0.01 to 0.6; claim requires the generalized abundance of trivalent cerium $[Ce^{+3}]/[Ce^{+3}]+[Ce^{+4}]$ is 0.01 to 0.6 (emphasis added)

--Para 0033 teaches the generalized abundance of trivalent cerium 0.01 to 0.6

--Para 0062 teaches the specific abundance of **positive** trivalent cerium expression $[Ce^{+3}]/[Ce^{+3}]+[Ce^{+4}]$ equals the specific 0.15 (emphasis added)

--Fig. 1 teaches specific examples of the generalized abundance of trivalent cerium

--Para 0026 teaches the different expression of Ce/In+Ce, distinct and unrelated to $[Ce^{+3}]/[Ce^{+3}]+[Ce^{+4}]$

--Para 0027 teaches ranges for the different expression

--Para 0066 teaches another different expression of Ce/In, distinct and unrelated to $[Ce^{+3}]/[Ce^{+3}]+[Ce^{+4}]$

--Fig. 1 teaches examples for the another different expression

Therefore no support exists that Appellant's Specification and figures teaches the expression $[Ce^{+3}]/[Ce^{+3}]+[Ce^{+4}]$ for the abundance of positive trivalent cerium is within the range 0.01 to 0.6 for the abundance of trivalent cerium.

- On p. 4-5, the Appellant argues that para 0026-0028 of the Specification contains support for the narrow range of Ce/In+Ce = 0.005 to 0.035.
- The Examiner respectfully disagrees. Appellant's Specification at para 0026-0028 teaches the expression Ce/In+Ce = 0.005-0.15, with a narrow range of

0.01-0.05. Appellant's fig. 1 teaches the expression Ce/In for the examples has the values 0.012, 0.035, and 0.07. The Examiner also points to the fact that the expression from fig. 1 is different than the expression from the Specification. Appellant's logic and reasoning flows from the fact that the examples from fig. 1 are encompassed by the range taught by Appellant's Specification, one of ordinary skill would envision Appellant's narrowly claimed range. However by this logic and reasoning, Appellant's could then claim a very large range with a few examples and then pick and choose an example to form a range simply to overcome the prior art. For example, Appellant could have a range of 0.000001-10000000 with examples of 0.003, 1, 55, 873, 11112, and 296782, and then form a claimed range of either 0.000001-1 or 55-10000000, which amounts to merely picking and choosing values to simply overcome the prior art. Therefore one of ordinary skill would not simply envision this range unless there was evidence or clear reasoning indicating that this narrower range was effective.

- On p. 5-6, the Appellant argues that the abundance of trivalent cerium being from 0.01-0.6 has been shown to be a critical value. The Appellant also argues that no basis is given that the calculated ratio of 0.05 is close enough to the claimed range of 0.005-0.035 that one of ordinary skill would have expected the same properties.

The Examiner respectfully disagrees. Fukuyoshi et al teaches forming a sputtering target comprising indium and cerium oxide (abstract), where cerium oxide is CeO_2, and thus teaches Ce to be tetravalent. Hosokawa et al teaches sputtering targets

comprising indium oxide and cerium oxide (p. 2, para 0032-0034, 0036), where the cerium oxide can be chosen from CeO_2 or Ce_2O_3 (i.e. trivalent cerium) with indium oxide (p. 3, para 0072, 0083). Therefore one of ordinary skill would find it obvious to interchange CeO_2 of Fukuyoshi et al with Ce_2O_3 taught by Hosokawa et al since both cerium oxides are functional equivalents, pending evidence from Appellant showing that the cerium oxides are not, which Appellant has not done. The particular abundance of the trivalent cerium is dependent upon oxygen concentrations present with the cerium, as taught by Bhosale. Since Appellant has not claimed a particular oxygen concentration that results in the claimed abundance of trivalent cerium, the particular abundance of trivalent cerium is result-effective variable based on oxygen and would be found through routine experimentation. Regarding no basis for the calculated ratio 0.05 having properties similar to the claimed ratio 0.035, Appellant's Specification at para 0027-0028 teaches the original range of 0.005-0.15, and the more preferred narrower range of 0.005-0.05, reduces abnormal discharge. The calculated ratio of 0.05 and claimed 0.035 both are within the preferred narrower range that reduces abnormal discharges according to Appellant. Therefore a basis has been provided as to why the calculated ratio 0.05 would have similar properties to the claimed ratio of 0.035.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/M. B./

Examiner, Art Unit 1723

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1723

Conferees:

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1723

/William Krynski/

Quality Assurance Specialist, TC 1700